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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/617,454	07/17/2000	Walter G. Branco	CY-0015	7824

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EXAMINER
SMETANA, JIRI F

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 07/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-5

Office Action Summary	Application No.	Applicant(s)	
	09/617,454	BRANCO ET AL.	
	Examiner	Art Unit	
	Jiri F. Smetana	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 April 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Objection to the drawings is withdrawn pursuant to Applicant's amendment to the specification.

2. Claims 1-20 are rejected.

Claim Objections

3. Claim 10 is objected to because of the following informalities:

Delete [having] between "have" and "a".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 1 and 10, the term "that may have" is ambiguous and is indefinite because the boundaries of protection are not clear. Particularly, it is not clear as to whether the chamber part contains a material redistributed thereon or not. Dependent claims 2-9 and 11-14 are also rejected because these claims fail to cure the indefiniteness of independent claims 1 and 10.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mintz, U.S. Patent No. 5,391,275.

The claimed invention reads on Mintz as follows: Mintz discloses a method of cleaning a plasma reactor chamber part comprising plasma cleaning a chamber part, that may have a material redistributed on the chamber part by a reactive plasma process (column 3, lines 24-31; column 7, lines 21-25), with a plasma having an etch selectivity between the chamber part and the redistributed material that is greater than 1:100, wherein the plasma is formed with a radio frequency power in the range of 40-500 W (column 4, lines 56-57).

The broad nature of the elements in the claims are read in the reference.

As to the limitation in claim 10 pertaining to the etch selectivity, Examiner takes official notice that it is an inherent feature that the etch selectivity between the chamber part and the redistributed material is greater than 1:100 because Mintz teaches that an alternative to sputter etch cleaning, the chamber part can be cleaned by gentle bombardament of plasma below the threshold and under process conditions where no shield etch material is physically removed (column 5, line 65 - column 6, line 5).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 4-8, 10, 12, 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz, U.S. Patent No. 5,391,275, in view of Weber et al., U.S. Patent No. 5,958,143.

Mintz discloses a method comprising of cleaning a plasma reactor chamber part, that may have a material redistributed thereon by a reactive plasma process (column 3, lines 24-31; column 7, lines 21-25), by placing the chamber part in a water ultrasonic cleaning bath (column 4, lines 28); wherein the plasma includes oxygen as source gas (column 6, lines 1-5); wherein the plasma is formed with a radio frequency power of 50-500 W (column 6, lines 57-58); and rinsing the chamber part after cleaning with the solvent but before the plasma cleaning (column 4, lines 29-31; column 7, lines 26-38).

Although Mintz discloses placing the chamber part in deionized water, Mintz does not disclose placing the chamber part in redistributed material solvent. However, Weber discloses cleaning with an acetone ultrasonic bath (column 2, lines 28-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the chamber part in a redistributed material solvent because Weber teaches that a process for cleaning surfaces with very demanding cleanliness requirements and utilizing environmentally safe cleaning materials (column 1, lines 56-58, 65-67).

As to claim 4, although Mintz discloses that placing the chamber part in a solvent for several minutes, it would have been obvious to place the chamber part in the solvent for at least 6 hours because Mintz teaches that the chamber part needs to be immersed to ensure thorough removal of all loose solid material (column 4, lines 26-28). Further, the selection of parameters such as time would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed

produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art such ranges are termed critical ranges and the applicant has the burden of proving such criticality. More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955).See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmscher* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

As to claim 10, Examiner takes official notice that it is an inherent feature that the etch selectivity between the chamber part and the redistributed material is greater than 1:100 because Mintz teaches that an alternative to sputter etch cleaning, the chamber part can be cleaned by gentle bombardament of plasma below the threshold and under process conditions where no shield etch material is physically removed (column 5, line 65 - column 6, line 5).

As to claim 18, Mintz does not disclose wherein the chamber part is ultrasonically cleaned after the oxygen plasma cleaning. However, Mintz discloses wherein the chamber part is ultrasonically cleaned before the oxygen plasma cleaning. It would have been obvious to one of ordinary skill in the art to ultrasonically clean the chamber part either before or after the oxygen plasma cleaning because the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to not patentably distinguish the processes. *Ex parte Rubin* 128 USPQ 440 (PTO BdPatApp 1959). Unless Applicant can show unexpected results, this

modification would have been obvious. It is also noted that Mintz teaches that various changes can be made to the disclosed process, including a pre-cleaning step (column 7, lines 26-38).

10. Claims 1, 4-8, 10, 12, 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz, U.S. Patent No. 5,391,275, in view of Wu et al., U.S. Patent No. 5,855,974.

Mintz discloses a method comprising of cleaning a plasma reactor chamber part, that may have a material redistributed thereon by a reactive plasma process (column 3, lines 24-31; column 7, lines 21-25), by placing the chamber part in a water ultrasonic cleaning bath (column 4, lines 28); wherein the plasma includes oxygen as source gas (column 6, lines 1-5); wherein the plasma is formed with a radio frequency power of 50-500 W (column 6, lines 57-58); and rinsing the chamber part after cleaning with the solvent but before the plasma cleaning (column 4, lines 29-31; column 7, lines 26-38).

Although Mintz discloses placing the chamber part in deionized water, Mintz does not disclose placing the chamber part in redistributed material solvent. However, Wu discloses cleaning with an acetone ultrasonic bath (column 3, lines 26-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the chamber part in a redistributed material solvent because Wu teaches that the object may be effectively cleaned by removing undesirable materials from the surface of the object without damaging the surface of the object itself (column 3, lines 51-57).

As to claim 4, although Mintz discloses that placing the chamber part in a solvent for several minutes, it would have been obvious to place the chamber part in the solvent for at least 6 hours because Mintz teaches that the chamber part needs to be immersed to ensure thorough removal of all loose solid material (column 4, lines 26-28). Also, Wu teaches that the time of

exposure to the organic solvent depends on such factors as concentration of the solution, level and type of contaminants, and whether an ultrasonic bath is employed (column 3, lines 37-42). Further, the selection of parameters such as time would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art such ranges are termed critical ranges and the applicant has the burden of proving such criticality. More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955).See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmscher* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

As to claim 10, Examiner takes official notice that it is an inherent feature that the etch selectivity between the chamber part and the redistributed material is greater than 1:100 because Mintz teaches that an alternative to sputter etch cleaning, the chamber part can be cleaned by gentle bombardament of plasma below the threshold and under process conditions where no shield etch material is physically removed (column 5, line 65 - column 6, line 5).

As to claim 18, Mintz does not disclose wherein the chamber part is ultrasonically cleaned after the oxygen plasma cleaning. However, Mintz discloses wherein the chamber part is ultrasonically cleaned before the oxygen plasma cleaning. It would have been obvious to one of ordinary skill in the art to ultrasonically clean the chamber part either before or after the

oxygen plasma cleaning because the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to not patentably distinguish the processes. *Ex parte Rubin* 128 USPQ 440 (PTO BdPatApp 1959). Unless Applicant can show unexpected results, this modification would have been obvious. It is also noted that Mintz teaches that various changes can be made to the disclosed process, including a pre-cleaning step (column 7, lines 26-38).

11. Claims 2, 3, 9, 11, 13, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz and Weber as applied to claims 1, 4-8, 10, 12, 14-18 above, in view of the admitted prior art.

Recitation of Mintz and Weber is repeated here from above.

Neither Mintz nor Weber disclose wherein the material includes photoresist polymers, the chamber part comprises quartz, or baking the chamber part at a temperature in the general range of 75-150°C for at least 15 minutes. However, the admitted prior art discloses wherein the material includes photoresist polymers (page 2, lines 4-6), the chamber part comprises quartz (page 3, line 8), and baking the chamber part at a temperature in the general range of 110°C for 30 minutes (page 3, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Mintz and Weber in view of the admitted prior art because the admitted prior art teaches that such features are all conventional and typical in reactive plasma systems (page 3, lines 9, 17-18).

12. Claims 2, 3, 9, 11, 13, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz and Wu as applied to claims 1, 4-8, 10, 12, 14-18 above, in view of the admitted prior art.

Recitation of Mintz and Wu is repeated here from above.

Neither Mintz nor Wu disclose wherein the material includes photoresist polymers, the chamber part comprises quartz, or baking the chamber part at a temperature in the general range of 75-150°C for at least 15 minutes. However, the admitted prior art discloses wherein the material includes photoresist polymers (page 2, lines 4-6), the chamber part comprises quartz (page 3, line 8), and baking the chamber part at a temperature in the general range of 110°C for 30 minutes (page 3, lines 5-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Mintz and Wu in view of the admitted prior art because the admitted prior art teaches that such features are all conventional and typical in reactive plasma systems (page 3, lines 9, 17-18).

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz and Weber as applied to claims 1, 4-8, 10, 12, 14-18 above, in view of Walter, U.S. Patent No. 6,348,101.

Recitation of Mintz and Weber is repeated here from above.

Neither Mintz nor Weber disclose rinsing the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning. However, Walter disclose rinsing the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning (column 3, lines 37-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to rinse the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning because Walter teaches that application of alcohol or acetone as a drying step drives off water from all surfaces of the component being cleaned (column 3, lines 37-42).

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mintz and Wu as applied to claims 1, 4-8, 10, 12, 14-18 above, in view of Walter, U.S. Patent No. 6,348,101.

Recitation of Mintz and Wu is repeated here from above.

Neither Mintz nor Wu disclose rinsing the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning. However, Walter disclose rinsing the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning (column 3, lines 37-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to rinse the chamber part with a liquid that evaporates at a lower temperature than water after the ultrasonic cleaning because Walter teaches that application of alcohol or acetone as a drying step drives off water from all surfaces of the component being cleaned (column 3, lines 37-42).

Response to Arguments

15. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jiri F. Smetana whose telephone number is (703)605-1173. The examiner can normally be reached on Monday-Friday (7:30am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703)608-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Jiri F. Smetana
Patent Examiner
Art Unit 1746

jfs
June 30, 2002

RANDY GULAKOWSKI
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